

REMARKS

Claims 1-40 are pending in the present application. Reconsideration of the claims is respectfully requested.

Amendments were made to the specification to correct errors and to clarify the specification. No new matter has been added by any of the amendments to the specification.

I. Objection to Specification

The Examiner objected to the Specification, stating that the Abstract has improper grammar. Applicants have amended the Abstract in response thereto. Therefore, the objection to the Specification has been overcome.

II. 35 U.S.C. § 103, Obviousness

A. It appears that the Examiner rejected Claims 1-5, 7-14, 16-17, 20-24, 26-32, 34-35 and 38-39 under 35 U.S.C. § 103 as being unpatentable over Endicott et al. (U.S. 6,047,295) in view of Wolczko et al. (U.S. 5,900,001). This rejection is respectfully traversed.

Claim 1 recites (i) responsive to conclusion of a communication process using the connection, starting a timer, (ii) maintaining a normal reference to a connection object for the connection, (iii) responsive to conclusion of a predetermined time period measured by the timer, maintaining a weak reference to the connection object, and (iv) periodically destroying connection objects maintained by weak references. As can be seen, Claim 1 recites both a connection and a connection object for the connection. The Examiner states that Endicott teaches step (ii) at Endicott column 1, lines 31-34. Applicants urge that there, Endicott merely states that objects include references (also known as pointers) to other objects so that a computer program can access information in one object by following a reference from another object. There is no teaching or suggestion in the cited passage, or in the entirety of the cited Endicott reference, of any type of *communication object for a connection to a server*. The only mention of any type of server connection is described at Endicott column 5, lines 33-37, where it merely states that one or more client

computer systems are coupled to a server system through a network. That is the extent of Endicott's teaching of a network or connection to a server. There is no teaching of how this connection operates. That is likely because the cited Endicott reference is not directed to any type of communication process at all, but rather is directed to an *internal process within a single client computer system*. Thus, Endicott has no need or other motivation to further describe any communication techniques. In contrast, Claim 1 is specifically directed to a method *for managing connections to a server in a distributed environment*. Applicants thus urge that none of the cited references teach or suggest claimed feature (ii) identified above.

Still further with respect to Claim 1, as the cited Endicott reference does not teach any type of connection object for a connection to a server, it similarly follows that Endicott does not teach the claimed step of *periodically destroying connection objects* maintained by weak references (missing claimed element (iv) identified above). In rejecting this aspect of Claim 1, the Examiner cites Endicott column 3, lines 24-33 as teaching this claimed step. Applicants urge that this passage makes no mention of the claimed *connection objects*, but rather merely describes objects generally. Claim 1 expressly recites that the connection object is for a connection to a server. The cited reference does not teach or otherwise suggest this specific type of object.

Still further with respect to Claim 1, the Examiner acknowledges that the cited Endicott reference fails to teach the claimed step of responsive to conclusion of a communication process using the connection, starting a timer (missing claimed step (i) identified above). The Examiner states that the cited Wolczko reference teaches at column 27, lines 17-21 the resetting of a count down timer if any card marker was marked. Applicants respectfully submit that such conditional timer operation is with respect to whether a card marker was marked, and has nothing to do with any type of communication or connection with a server, and thus does not teach the claimed step of *responsive to conclusion of a communication process using the connection*, starting a timer. Rather, Wolczko's card marker is described as being a block of internal memory (the heap) that has been segmented into equal sized areas (called 'cards'), as described at Wolczko column 5, lines 1-5. It is thus urged that the cited Wolczko reference does not teach any type of connection to a server (but rather teaches an internal process operating

solely within a single computer), and thus does not teach or otherwise suggest starting a timer *responsive to conclusion of a communication process* using such (missing) connection. Thus, Claim 1 is further shown to have been erroneously rejected.

Still further with respect to Claim 1, Applicants urge that none of the cited references teach or suggest the claimed feature of "responsive to conclusion of a predetermined time period measured by the timer, maintaining a weak reference to the connection object" (missing claimed element (iii) identified above). In rejecting this aspect of Claim 1, the Examiner states that Wolczko teaches this step at column 19, lines 23-29. Applicants urge that there, Wolczko describes what a weak pointer is, but provides no specific operating steps with respect to such weak pointers, and in particular does not teach or otherwise suggest any use of a timer in managing weak pointers, and does not teach or otherwise suggest the specific claimed step of *responsive to conclusion of a predetermined time period measured by the timer*, maintaining a weak reference to the connection object. Thus, it is further urged that Claim 1 has been erroneously rejected by the Examiner. To establish prima facie obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. MPEP 2143.03 (emphasis added by Applicants). See also, *In re Royka*, 490 F.2d 580 (C.C.P.A. 1974).

Applicants initially traverse the rejection of Claims 2-5 and 7-12 for reasons given above with respect to Claim 1 (of which Claims 2-5 and 7-12 depend upon).

Further with respect to Claim 4, Applicants urge that none of the cited references teach or suggest the claimed steps of (i) determining whether a weak reference to the connection object exists, (ii) determining whether the connection object has been destroyed if the weak reference exists, and (iii) reusing the connection if the connection object has not been destroyed. In rejecting Claim 4, the Examiner states missing claimed step (i) is taught by Endicott at column 7, lines 43-47. Applicants urge that this passage merely describes the existence of a flag (a referenced object reachable indicator) associated with a weak reference, and does not teach any determination being made on *whether a weak reference to a connection object exists*, as expressly recited in Claim 4.

Claimed step (ii) is directed to a conditional determination being made, the condition being "if the weak reference exists", and the *determination* being made is based upon such condition being "determining whether the connection object has been

destroyed". In rejecting this aspect of Claim 4, the Examiner cites Endicott column 7, lines 47-52 and column 14, lines 44-47 as teaching this claimed feature. Applicants urge that the passage cited at Endicott column 7 describes the details of *how the flag* (a referenced object reachable indicator) *is associated with a weak reference*, such as a dedicated field in an object encapsulating the weak reference. This passage does not describe any type of determination being made with respect to whether a connection object has been destroyed, but rather merely describes the location of a flag. As to the passage cited at column 14, Applicants urge that this passage describes conditional operations with respect to a *collected* object (collected as part of garbage collection). In contrast, Claim 4 is directed to a *connection* object for a connection to a server. This cited passage of Endicott makes no mention of any such connection object, and since there is no teaching/suggestion of any type of connection object for a connection to a server, it necessarily follows that there is no teaching or suggestion of the claimed step of determining whether such (missing) connection object has been destroyed. It is thus further urged that the Examiner has failed to properly establish a prima facie showing of obviousness with respect to Claim 4.

Claimed step (iii) is directed to *reusing a connection if* the connection object has not been destroyed, and thus is a conditional action based upon whether a particular condition (the connection object has not been destroyed) exists. In rejecting this aspect to Claim 4, the Examiner cites Endicott column 10, line 48 – column 11, line 2 and column 14, lines 33-50). Applicants urge that the passage cited beginning at column 10 is a program flow of a dereference weak reference routine, and does not mention in any way a connection to a server, or a *conditional reuse of a connection to a server*. Applicants urge that the passage cited at column 14 similarly does not mention any type of connection to a server, and thus does not teach or otherwise suggest a conditional reuse of a connection to a server. Thus, it is further shown that Claim 4 has been erroneously rejected as a proper prima facie showing of obviousness has not been established by the Examiner.

Further with respect to Claim 7, Applicants urge that none of the cited references teach or suggest the claimed feature of "sending notification to the server that the connection object is unreferenced when a weak reference to the connection object is

maintained". As can be seen, this claimed feature involves co-action with a server based upon occurrence of a particular event. In rejecting Claim 7, the Examiner cites Endicott Col. 6, line 66 – Col. 7, line 15 as teaching this claimed feature. Applicants show that there, Endicott states:

In the illustrated embodiment, weak references are managed using a concurrent mark sweep collector that operates in a collector thread concurrently with other program threads executing in the computer system. Performance of the computer system is improved by selectively inhibiting access by other program threads to only those weak references that reference objects not yet known to be strongly-reachable during the current collection cycle. Access to weak references that reference known strongly-reachable objects is permitted, however, since it is ensured that those strongly-reachable objects will not be later collected by the collector in the current collection cycle, and thus that the weak references will not be cleared by the collector during processing of the weak references. Consequently, there is no risk that a pointer retrieved from a weak reference during an access thereto will become invalid as a result of the collection process.

As can be seen, this passage describes management of weak object references, and in particular describes a technique of selectively inhibiting access by other program threads to only those weak references that reference objects not yet known to be strongly-reachable during a garbage collection cycle. This cited passage does not describe any specific server co-action technique or action, and in particular does not describe a step *sending of a notification to a server that the connection object is unreferenced when a weak reference to the connection object is maintained*. Rather, the reference merely states that various application programs, objects, modules, etc. may also execute on the server of other computer systems in a distributed computer environment. There is no explicit teaching/suggestion of *sending of a notification to a server that the connection object is unreferenced when a weak reference to the connection object is maintained*. Therefore, Claim 7 is yet further shown to have been erroneously rejected as a proper prima facie case of obviousness has not been established by the Examiner.

Further with respect to Claim 8, Applicants urge that the cited reference does not teach the claimed feature of "wherein the step of periodically destroying connection

objects maintained by weak references comprises destroying the connection object in response to *garbage collection by the server*". As can be seen, this claim expressly recites a step of periodic destroying of connection objects", with such destruction being *in response to garbage collection by the server*. In rejecting Claim 8, the Examiner cites Endicott Col. 2, lines 1-4 and Col. 3, lines 46-67. Applicants urge that the passage cited at Endicott column 2 describes a sweep stage, where a collector scans through objects and deallocates any memory reserved for the objects that are unmarked as of completion of the mark stage. Such passage does not teach or otherwise suggest any step of destroying a connection object in response to garbage collection *by the server* (which is connected to the client by the connection). As to the cited Endicott passage at column 3, Applicants show that there, Endicott states:

The invention addresses these and other problems associated with the prior art by providing a computer system, program product, and method of managing weak references with a concurrent mark sweep collector that, while processing weak references, inhibit access to only those weak references whose referenced objects have not yet been determined to be strongly-reachable (i.e., reachable other than through a weak reference) during a current collection cycle. Selective access inhibition in this manner is possible due to the realization that, once an object referenced by a particular weak reference is determined to be strongly-reachable during a current collection cycle, the object is ensured of not being collected during the current collection cycle. Moreover, the weak reference is also ensured of not being cleared when it is processed by the collector given its reference to a known strongly-reachable object. Additional synchronization for this weak reference is thus unnecessary for the remainder of the current collection cycle after the determination is made, so other program threads may be permitted to freely access this weak reference without waiting for the collector to complete the processing of all existing weak references.

As can be seen, this passage describes a selective access inhibition technique for internal garbage collection by a computer, so that other program threads may be permitted to access weak references without waiting for the garbage collector to complete processing of all existing weak references. Such passage does not describe (i) garbage collection for a client being done *by a server*, or (ii) any periodic destroying of a *connection object* (the connection object being for a connection to a server). Thus, Claim 8 is yet further shown

to have been erroneously rejected, as a proper prima facie showing of obviousness has not been established by the Examiner.

With respect to Claim 13, such claim recites a method, in a client, for reusing a connection to a server. This method includes steps of (i) identifying a weak reference to a connection object for a connection to a server, (ii) determining whether the connection object has been destroyed, and (iii) reusing the connection if the connection object has not been destroyed. As can be seen, a connection object is used in managing a connection to a server. A weak reference to a connection object for a connection to a server is identified. A determination is made as to whether this connection object has been destroyed. The connection to the server is reused if the connection object has not been destroyed. In rejecting Claim 13, the Examiner cites Endicott column 7, lines 43-47 as teaching claimed step (i) listed above. Applicants urge that there, Endicott states:

“Each weak reference also has associated therewith a referenced object reachable indicator which indicates, for a current collection cycle, whether the object referenced by the weak reference has been determined to be strongly-reachable for the current collection cycle.”

As can be seen by a careful reading of this cited passage, it discusses the existence of an object that is currently referenced by a weak reference, and the weak reference has associated therewith a flag (a referenced object reachable indicator) which indicates whether this object has been determined to be strongly-reachable for the current collection cycle. It is respectfully urged that this passage makes no mention of any type of connection object for a connection to a server, and thus does not teach or otherwise suggest the claimed step of identifying a weak reference *to a connection object for a connection to a server*. Thus, it is urged that Claim 13 has been erroneously rejected, as a proper prima facie case of obviousness has not been established with respect to claimed element (i) identified above.

Still further with respect to Claim 13, as there is no teaching or suggestion of a connection object for a connection to a server, it necessarily follows that there is no teaching or suggestion of determining whether such (missing) connection object has been

destroyed. In rejecting this aspect of Claim 13, the Examiner cites Endicott column 7, lines 47-52 and column 14, lines 44-47 as teaching this claimed feature. As to the passage cited at column 7, Applicants urge that this passage describes the details of how a flag (a referenced object reachable indicator) is associated with a weak reference, such as a dedicated field in an object encapsulating the weak reference. This passage does not describe any type of determination being made with respect to whether a connection object has been destroyed, but rather merely describes the location of a flag. As to the passage cited at column 14, Applicants urge that this passage describes conditional operations with respect to a *collected* object (collected as part of garbage collection). In contrast, Claim 13 is directed to a *connection* object for a connection to a server. This cited passage of Endicott makes no mention of any such connection object, and since there is no teaching/suggestion of any type of connection object for a connection to a server, it necessarily follows that there is no teaching or suggestion of the claimed step of determining whether such (missing) connection object has been destroyed. It is thus further urged that the Examiner has failed to properly establish a prima facie showing of obviousness with respect to Claim 13.

Still further with respect to Claim 13, claimed step (iii) identified above is with respect to reusing a connection to a server. This reuse of the connection to the server is *conditioned upon* whether the connection object has been destroyed (if it has not been destroyed, the connection to the server is reused). In rejecting this aspect of Claim 13, the Examiner cites Endicott column 10, line 48 – column 11, line 2 and column 14, lines 33-50 as teaching this claimed step. Applicants urge that the passage cited beginning at column 10 is a program flow of a dereference weak reference routine, and does not mention in any way a connection to a server, or a *conditional reuse of a connection to a server*. Applicants urge that the passage cited at column 14 similarly does not mention any type of connection to a server, and thus does not teach or otherwise suggest a conditional reuse of a connection to a server. Thus, it is further shown that Claim 13 has been erroneously rejected as a proper prima facie showing of obviousness has not been established by the Examiner.

Still further with respect to Claim 13, the Examiner has cited a single reference (Endicott) as teaching all three claimed steps, and yet Claim 13 is rejected “under 35

U.S.C. 102(b) as being anticipated by Endicott et al. (U.S. 6,047,295) hereinafter referred to as Endicott in view of Wolczko et al. (U.S. 5,900,001) hereinafter referred to as Wolczko". Applicants urge that this rejection is improper, and erroneous, as two references are being used in a 35 U.S.C. 102(b) rejection, which is clear error. At first, Applicants were treating this as a typographical error, and assumed that the Examiner intended this 35 U.S.C. 102 rejection to instead be a 35 U.S.C. 103 rejection since two references were being cited by the Examiner in such rejection. Yet, Claim 13 is being rejected using a single reference (Endicott), so Applicants are unable to ascertain the Examiner's true intentions as to the statutory basis for the rejection of Claim 13. It is thus further urged that Claim 13 has been erroneously rejected as failing to clearly articulate the statutory basis for the rejection of such claim.

Applicants traverse the rejection of dependent Claims 14, 16 and 17 for reasons given above with respect to Claim 13.

Applicants traverse the rejection of Claims 20-24, 26-30 and 38 for similar reasons to those given above with respect to Claim 1.

Applicants traverse the rejection of Claims 31, 32, 34, 35 and 39 for similar reasons to those given above with respect to Claim 13.

Therefore, the rejection of Claims 1-5, 7-14, 16-17, 20-24, 26-32, 34-35 and 38-39 under 35 U.S.C. § 103 has been overcome.

B. The Examiner rejected Claims 6, 15, 25 and 33 under 35 U.S.C. § 103 as being unpatentable over Endicott and Wolczko as applied to claims 4 and 23, respectively, in view of Official Notice. This rejection is respectfully traversed.

Applicants initially traverse the rejection of Claims 6, 15, 25 and 33 for similar reasons to those given above with respect to Claim 1.

Further with respect to Claim 6, Applicants urge that none of the cited references teach or suggest the claimed feature of "establishing a new connection if the connection object has been destroyed". The Examiner states that this feature is well-known, because "a connection object is implicitly new if the previous connection object was destroyed". Applicants respectfully submit that Claim 6 is *not* directed to establishing a new *connection object* if a connection object has been destroyed, but rather is directed to

establishing a new *connection* if the connection object has been destroyed. It is thus urged that the Examiner's "well-known" assertion fails to establish any teaching or suggestion of the features recited in Claim 6, and thus Claim 6 is further shown to have been erroneously rejected. Applicants further request that if instead, the Examiner meant to state that a connection is implicitly new of a previous connection object is destroyed is well-known, Applicants request specific evidence of such well-known fact, such as by providing an affidavit, per 37 CFR 1.104(d)(2).

As to Claims 15, 25 and 33, Applicants traverse the rejection of such claims for similar reasons to those given above with respect to Claim 6.

Therefore, the rejection of Claims 6, 15, 25 and 33 under 35 U.S.C. § 103 has been overcome.

C. The Examiner rejected Claims 18, 36 and 40 under 35 U.S.C. § 103 as being unpatentable over Endicott and Wolczko, in view of Geise et al. (U.S. 5,247,520). This rejection is respectfully traversed.

With respect to Claim 18, such claim recites a method, in a client, for caching connections to a server. The method includes steps of (i) adding a reference to a connection object for a connection to a weak hash map and a hash map, (ii) responsive to conclusion of a communication process using the connection, starting a timer, and (iii) responsive to conclusion of a predetermined time period measured by the timer, removing the reference to the connection object from the hash map. None of these claimed steps are taught or suggested by any of the cited references, as will now be shown in detail.

As to missing claimed step (i) identified above, the Examiner merely states that "Endicott teaches a hash map", citing Endicott column 2, lines 56-59. Applicants respectfully submit that step 1 of Claim 18 recites a weak hash map *and* a hash map, where a reference to a connection object for a connection is added *to both* the weak hash map and the hash map. The cited passage merely describes the existence of a hash table, but does not teach or otherwise suggest *both* weak hash map *and* a hash map, as expressly recited in Claim 18, nor does this passage teach or otherwise suggest adding a reference to a connection object for a connection *to both of these hash maps*. Thus, the

Examiner has failed to properly establish a prima facie showing of obviousness with respect to Claim 18.

As to missing claimed step (ii) identified above, the Examiner acknowledges that the cited Endicott reference does not teach such claimed step, but states that Wolczko teaches that if any card marker was marked, a count down timer is reset. Applicants urge that such assertion does not establish any teaching or suggestion of the claimed step of *"responsive to conclusion of a communication process using the connection, starting a timer"*, for similar reasons as articulated above with respect to missing claimed step (i) of Claim 1.

As to missing claimed step (iii) identified above, the Examiner cites Wolczko's teaching at column 27, lines 8-23 as teaching this claimed step. Applicants urge that there, Wolczko describes garbage collection on a block of memory (a "card"), and does not teach any type of operation occurring that is responsive to conclusion of a predetermined time period as measured by a timer, and thus it necessarily follows that this cited passage does not teach or otherwise suggest *"responsive to conclusion of a predetermined time period measured by the timer, removing the reference to the connection object from the hash map"*. The only timer-related operation is the resetting a timer if it is determined that a card marker is marked. This is an action operated on the timer itself (responsive to the status of a card marker), and not an action that is responsive to a timer, as claimed. It is thus further shown that a proper prima facie case of obviousness has not been established with respect to Claim 18, as all the claimed elements are not taught or suggested by the cited references.

Applicants traverse the rejection of Claims 36 and 40 for similar reasons to those given above with respect to Claim 18.

Therefore, the rejection of Claims 18, 36 and 40 under 35 U.S.C. § 103 has been overcome.

D. The Examiner rejected Claims 19 and 37 under 35 U.S.C. § 103 as being unpatentable over Endicott and Wolczko and Geise, further in view of Weinstein et al. (Google Groups comp.lang.java.databases). This rejection is respectfully traversed.

Applicants initially traverse such rejection for reasons given above with respect to Claim 18 and 36 (of which Claims 17 and 37 depend upon, respectively).

Applicants further traverse this rejection by showing that none of the cited references teach or suggest the claimed feature of “maintaining the reference to the connection object in the weak hash map if the connection object has not been destroyed to thereby allow use of such connection object by a subsequent communication process between the client and server without establishing a new connection between the client and server”. In rejecting this aspect of Claim 19, the Examiner cites Weinstein as teaching this claimed feature. Applicants urge that the Weinstein reference is non-enabling, as it is merely a listing of various email exchanges between people, and provides no enabling teaching or suggestion of the claimed feature of “maintaining the reference to the connection object in the weak hash map if the connection object has not been destroyed to thereby allow use of such connection object by a subsequent communication process between the client and server without establishing a new connection between the client and server”. For example, there is no mention of any type of weak hash map, and thus there is no teaching or suggestion of maintaining the reference to the connection object *in the weak hash map if the connection object has not been destroyed*. Thus, Claim 19 (and similarly for Claim 37) is further shown to have been erroneously rejected.

Therefore, the rejection of Claims 19 and 37 under 35 U.S.C. § 103 has been overcome.

III. Conclusion

It is respectfully urged that the subject application is patentable over the cited references and is now in condition for allowance. The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

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Respectfully submitted,



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